



Volume 16, Number 5
September - October 1999

Director's Note

In the mid-1980s, soon after the Institute of Ecosystem Studies opened, we had approximately 85 full- and part-time employees. I frequently gave tours of the Plant Science Building to new staff, and as we walked through the laboratory wing I pointed proudly to the ample research space.

During the decade that followed, the Institute grew rapidly. Our off-site research programs expanded as well, and from across New York and New England, from Baltimore and Wisconsin, from Chile and Israel, the number of samples shipped to our analytical laboratories multiplied accordingly.

It became clear that we needed more research space. We outlined our needs, met with architects, and solicited bids from contractors. In late August, without fanfare, work began on a new research facility. In the cover story of this issue of the newsletter, you will learn more about the laboratory and about the capital campaign that is supporting its construction.

The *IES Newsletter* is published by the Institute of Ecosystem Studies, located at the Mary Flagler Cary Arboretum in Millbrook, New York.

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Construction Begins, Challenge Is Met

As earth moving machinery rolled off trailers in the rear parking lot at the Plant Science Building late in August, the Institute of Ecosystem Studies moved toward a goal we set for ourselves two years ago. Work on the new laboratory building had begun.

for fourteen research assistants and the analytical laboratory staff.

In 1997, upon considering its future, the Institute realized that two things were especially critical to the continuing success of its research and education



The open area just south of the Plant Science Building has been cleared and leveled to make room for a new laboratory building.

Over the course of a typical year, the Institute provides research facilities for 25 staff scientists, their research assistants, graduate students alternating between university classes and IES field and laboratory work, and as many as a dozen visiting investigators who come from around the world to collaborate with IES scientists. This level of use, coupled with the ever-increasing complexity of tools required for modern science, soon will be more than the existing laboratory facilities in the Plant Science Building can accommodate. Now, a state-of-the-art laboratory will provide the advanced technology required for ecological research, and also will enable more students, postdoctoral associates and visiting scientists to do research here. The target completion date is late summer 2000.

The new facility is being built in the space just south of the Plant Science Building. Connected to the existing laboratory wing by a passageway, the 12,500-square foot building will have nine laboratories for individual scientists, an enhanced analytical laboratory and an expanded instrument laboratory. A central area, for use by all researchers, will provide additional space for shared facilities and equipment. There also will be workspace

programs. One was this new laboratory building. The other was the establishment of an endowed G. Evelyn Hutchinson Chair in ecology. To fund these tools, IES embarked on a three-year, \$6 million "Campaign for the Institute of Ecosystem Studies."

This capital campaign, which runs through 31 December 1999, received a tremendous boost in July 1998 when The Kresge Foundation — an independent private foundation located in Troy, Michigan that supports projects involving construction or renovation of facilities — awarded the Institute a \$300,000 challenge grant. To meet the challenge, IES had to raise \$950,000 by October 1999. On 30 September, Institute Director Dr. Gene Likens announced that we had succeeded.

"All of you have played a major role in this success," he told IES staff who had been invited to gather at the Plant Science Building. "The Kresge Foundation challenge grant was a highly competitive one, and if we had not raised the target amount by the set date, we would have received nothing from them." Dr. Likens explained that the Institute benefited from the generous support of numerous individuals, foundations, and corporations to meet the Kresge deadline.

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IES Ecologist Discovers New Groundwater Animal

"An enigmatic interstitial clitellate" is how the animal is described in the title of the journal article that introduces it to the scientific community. Quite a mouthful, you say? OK ... how about: "aquatic earthworm"? Read on, and you'll probably agree that, no matter how you describe it, *Parvidrilus strayeri* is an animal worth looking at.

The History

Dr. David Strayer's research focus is freshwater invertebrates. As an aquatic ecologist at IES, his principal areas of study are the ecological consequences of the zebra mussel invasion; the ecology and conservation biology of pearly mussels; and groundwater fauna. It was in the early 1990s while he was studying the influence of glaciation on the latter that he made a discovery.

By way of background, Dr. Strayer explains that during the 2 million years of glaciation prior to the end of the Ice Age 18,000 years ago, the northeastern United States was scoured clean of many of its indigenous invertebrates. The southeastern U.S., however, remained uncovered by ice and consequently there is greater diversity among its invertebrate animals, including those in its groundwater ecosystems. In the course of his research, Dr. Strayer studied seven spots between Pennsylvania and Florida and found that the highest diversity of invertebrate animals in groundwater was in the Smoky Mountains and in northern Alabama.

The groundwater that Dr. Strayer investigates is that which flows through gravel under a stream bed. "There are huge numbers of invertebrates in stream gravel," says the ecologist, who collects the animals by driving a pipe into a gravel bar, then pumping up water. One of Dr. Strayer's prerequisites for selecting a sampling site is that it be unpolluted. Sadly, there aren't too many pristine sites left in the eastern United States, but scientists at the University of Alabama directed him to a stream called Hendrick Mill Branch, near Birmingham, which met his cleanliness criteria. Here,

there was a deep gravel deposit with good water flow and ample pore space for creatures to live. And it was here that he collected many animals that have never before been seen, including the tiny oligochaete that eventually was to be named after him.

The Biology

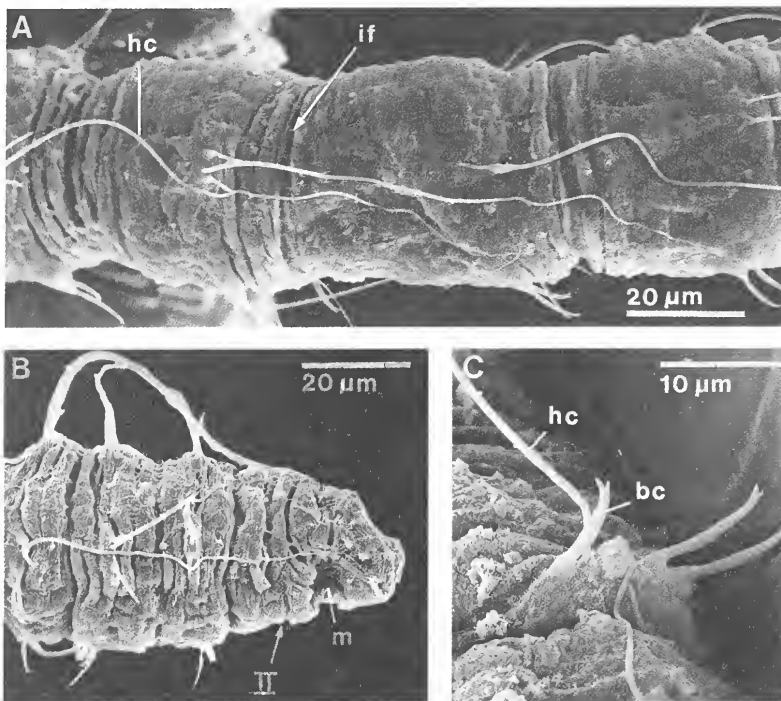
From high school biology, you will recall that the phylum Annelida comprises segmented worms. Of the four classes in the phylum, perhaps the best-known is Oligochaeta, the earthworms. While not

Dr. Erséus examined the worm and found that it was the single member of a new family, which he named Parvidrilidae; he also named the genus, *Parvidrilus*, and the species, *strayeri*, after its discoverer. "Many groundwater animals have become miniaturized," Dr. Strayer explains, "presumably to live between grains of sediment and also to survive where food is scarce." *Parvidrilus* is a good example of this, he says, noting that it's probably the smallest oligochaete in the world, with a weight approximately one-millionth that of a nightcrawler. Dr.

Erséus' paper describing the new creature was published in the 15 June 1999 issue of the Proceedings of the Biological Society of Washington. Samples are in the curated worm collections at the Smithsonian Institution and the Swedish Museum of Natural History.

The Future

Dr. Strayer explains that *P. strayeri* has not yet been found anywhere except at the northern Alabama site, where, he notes, it is plentiful. Is this an animal that is endemic to America? Or will it show up in other countries? "If worms in the family Parvidrilidae evolved before North America and Europe separated," he says, "there might be species related to *P. strayeri* on the other side of the Atlantic." Irrespective of the when and where of continental drift, he suspects that parvidrilids will be found in other parts of the unglaciated southeastern U.S. Any future discoveries of species from this family of worms, he says, will provide new knowledge about evolution.



A scanning electron microscope (SEM) bounces electrons off a specimen and provides an image that appears three-dimensional. These SEM micrographs are from Dr. Christer Erséus' paper describing the new species, *Parvidrilus strayeri* (in: Proceedings of the Biological Society of Washington, 112(2): 327-337. 1999). A. Like all annelid worms, *P. strayeri* is segmented; this view shows segments and chaetae (bristles), which are also typical of the phylum. B. Anterior end of the worm, showing mouth (m). C. Hair chaeta (hc) are long, simple-pointed bristles and bifid crotchets (bc) are shorter bristles with a doubled tip. (Scale: 1µm = 10⁻⁶ millimeter)

an expert on oligochaetes, Dr. Strayer recognized that the 1.4 millimeter (less than one-sixteenth of an inch) worm filtered from groundwater was new to science. In 1992, hoping to find someone who could identify it, he brought samples to an oligochaete conference where some 30 or 40 experts in the field were sharing current research findings. Dr. Christer Erséus of the Swedish Museum of Natural History in Stockholm is one of the world's predominant oligochaete taxonomists, and it was he who agreed to look at Dr. Strayer's discovery.

Annual Holiday Sale

Saturday, December 4, 9 a.m. - 4p.m.
Sunday, December 5, 11 a.m. - 4 p.m.

10% discount
on all regularly priced merchandise ...

holiday plants ... gardening accessories,
books and gifts for gardeners ... field
guides ... handpainted ornaments ...
windchimes ... nature & science books
and educational toys for children ... and
much more

Dr. Hogan Is a National Academy of Education Fellow

"Service Learning", in which students do volunteer work during school hours, for academic credit, is gaining increasing popularity as a mode of education. While not a substitute for traditional classroom teaching, participation in service learning projects helps to broaden students' perspectives, instilling in them a sense of community values and an awareness of the world of which they're a part. But what are the nature, quality, and depth of students' academic learning while participating in service projects? This is a question being investigated by Dr. Kathleen Hogan, with a fellowship from the National Academy of Education.

Dr. Hogan, IES educational psychologist, studies students' learning, thinking and reasoning processes as they learn science, particularly ecology. One of her current research projects, as a 1999-2000 National Academy of Education/Spencer Postdoctoral Fellow, focuses on students who are participating in a project that is

supported in part by the federal Learn and Serve America program. Eighteen 10th, 11th and 12th-graders and their teacher are working with their county's Environmental Management Council on a project that links their environmental science studies with community service — a scenario that lends itself well to Dr. Hogan's research interests.

The goal of the project is to make a watershed management plan for an important tributary of the Hudson River. The students, in conjunction with adult volunteers from the community, are monitoring water quality, analyzing data, and building a GIS (Geographic Information Systems) database. Over the course of this academic year, Dr. Hogan is participating in all phases of the project, working with and observing the students. Periodically she interviews them individually to assess learning and to hear their perspectives on their experiences. At the end of the first year of the two-year fellowship period, she will present her

preliminary findings to the annual meeting of the National Academy of Education, and then disseminate her final results through articles in educational research journals.

The National Academy of Education, with offices at New York University, is an honorary educational society whose membership comprises the most distinguished researchers in the field of education. Each year, members of the National Academy select a new cohort of fellows. Fellowships are funded by a grant to the Academy from the Spencer Foundation, to "enhance the future of research in education by developing new talent in the many branches of educational scholarship". Competition is tough: this year, Dr. Hogan was one of 33 fellows selected from a group of approximately 200 scholars with a range of specialization within the broad field of educational research, from anthropology to history, from policy studies to science education. ●

Construction Begins, Challenge Is Met, *from page 1*

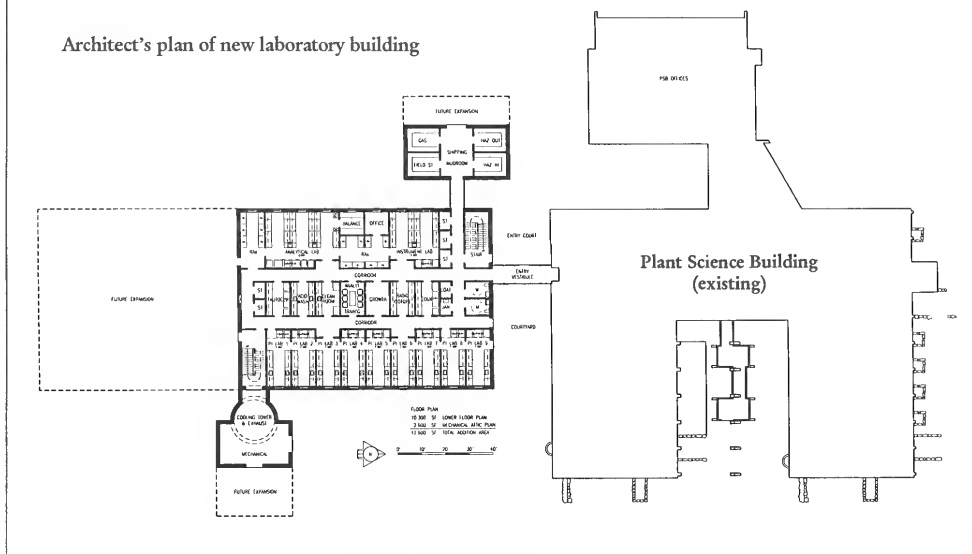
IES Development Officer Jan Mittan praised "the tremendous show of support from Institute friends." Noted Ms. Mittan, "Thanks to this support, we met a major \$1 million matching grant from the Mary Flagler Cary Charitable Trust, in addition

to meeting The Kresge Foundation challenge grant."

The Campaign for the Institute of Ecosystem Studies concludes at the end of this year. "I have an excellent and hard-

working staff — Development Associate Suzanne Baker and Development Specialist Laura Corrado — and we are confident that the Institute will have more good news to share at that time," Ms. Mittan said. ●

Architect's plan of new laboratory building



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Newsletter

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Calendar

IES SEMINARS

CONTINUING EDUCATION

For information, call the Continuing Education office at 914-677-9643. Programs during November and December include:

Landscape Design

Nov. 17 (5 sessions): **Graphics II**
Workshop

Dec. 12: **Growing Interest in the Internet: An Introduction for Gardeners, Landscape Designers and Illustrators**
Crafts

Nov. 20: **Festive Fall Arrangement**
Dec. 4: **Fresh Green Holiday Wreath**
Dec. 18: **Fresh Holiday Arrangement**

The winter/spring 2000 semester begins on January 19. If you're not already on the Continuing Education Program mailing list, call 914-677-9643 to request a copy of the free catalogue of gardening, landscape design, natural science illustration, and biology & earth science classes, workshops, ecological excursions and garden tours. Catalogues will be available in mid-December.

Natural Science Book Club

The IES Continuing Education Program sponsors a book club that explores titles in the fields of gardening, natural history, landscape design and environmental science. Open to the public, the gatherings bring together those with dual interests in nature and reading. Meetings are at the Gifford House Visitor and Education Center at 7:30 pm. Call (914) 677-9643 for information. Free. Refreshments are served.

VOLUNTEER OPPORTUNITIES

Current Needs

Education Program Office: weekday telephone reception

IES Ecology Shop: weekday and weekend visitor orientation and/or customer assistance

Business Office: clerical assistance

Scientific Administrative Office: clerical assistance

Call Ms. Su Marcy at 914-677-7641.

Free **scientific seminars** are held each Friday at 11:00 a.m. in the IES Auditorium.

Nov. 19: **Where in the World is Carbon Sandiego? Forest Carbon from Real Data.** Dr. Jennifer C. Jenkins, USDA Forest Service Northern Global Change Program, South Burlington, Vermont

Dec. 3: SPECIAL SEMINAR SERIES ON HETEROGENEITY: **How Much Habitat Is Enough?** Dr. Lenore Fahrig, Carleton University, Ottawa. This seminar is one of a special series on "Ecosystem Function in Heterogeneous Landscapes." Lectures will parallel research of IES scientists and colleagues and are partially sponsored by The Andrew W. Mellon Foundation.

The winter/spring seminar program begins on Friday, January 14, 2000, with a talk by Dr. Geoffrey Heal, Garret Professor, Columbia Business School.

IES ECOLOGY SHOP

New in the Shop ... scarves in floral and nature patterns ... embroidered T-shirts and sweatshirts ... nature-theme jewelry and jewelry boxes ... for children ... puzzles: never-ending beetles, nature-theme triazzles, insect 3-D squares ... mobiles: insects, tropical rainforest ... **and in the Plant Room ...** stepping stones kit ... frog yard sprinklers ... holiday plants, including amaryllis, poinsettia & cyclamen, are coming soon!
Senior Citizens Days: 10% off on Wednesdays
• *Gift Certificates are available* •

HOURS

Winter hours: October 1 - March 30

Public attractions are open Mon. - Sat., 9 a.m.-4 p.m. & Sun. 1-4 p.m., with a free permit.

(Note: The Greenhouse closes at 3:30 p.m. daily.)
The IES Ecology Shop is open Mon.-Fri., 11 a.m.-4 p.m., Sat. 9 a.m.-4 p.m. & Sun. 1-4 p.m.

(The shop is closed weekdays from 1-1:30 p.m.)

• *Free permits are required for visitors and are available at the IES Ecology Shop or the Education Program office daily until 3 p.m.*

GREENHOUSE

The IES greenhouse, a year-round tropical plant paradise and a site for controlled environmental research, is open until 3:30 p.m. daily except public holidays. Admission is by free permit (see HOURS).

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$30; family membership: \$40. Call Ms. Laura Corrado in the Membership Office at 914-677-5343.

The Institute's Aldo Leopold Society

In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call Ms. Jan Mittan at 677-5343.

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IES Ecology Shop: 914-677-7649

Street address: Gifford House Visitor and
Education Center, Route 44A, Millbrook, N.Y.

... IES website: www.ecostudies.org

For information on current IES public events and attractions, visit: www.ecostudies.org/welcome/ThisWeek.html.

For garden tips, follow the link to the Perennial Garden Archives.